

IN THE CLAIMS:

The claims pending in the present application are as follows:

1. (Previously presented): An implant system for promoting fusion bone growth in the space between adjacent vertebrae, comprising:
 - at least first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members including
 - opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae,
 - said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces, and
 - at least said first load bearing member including at least one opposite end piece having a truncated surface that defines a cutout region; and
 - wherein at least one of said opposite end pieces of said second load bearing member is nested within said cutout region.
2. (Previously presented): The implant system of claim 1, wherein said first load bearing member includes a first end piece and a second end piece, said first end piece including a truncated surface and having a first dimension between said two opposite surfaces and a second dimension transverse to said first dimension, said first dimension being greater than said second dimension, said first dimension being sized to maintain the space between adjacent vertebrae.

3. (Withdrawn): The implant system of claim 2, wherein said second end piece of said load bearing members includes truncated non-circular surfaces between said two opposite surfaces.

4. (Withdrawn): The implant system of claim 3, wherein said truncated non-circular surfaces are substantially flat.

5. (Withdrawn): The implant system of claim 4, wherein said first end piece of said load bearing members has an arcuate surface.

6. (Withdrawn): The implant system of claim 5, wherein each of said two opposing surfaces of said second end piece has an arcuate surface.

7. (Withdrawn): The implant system of claim 6, wherein said first end piece of said second load bearing member is substantially cylindrical and is nested within said first end piece of said first load bearing member.

8. (Withdrawn): The implant system of claim 7, wherein said first end piece of said second load bearing member includes a truncated surface.

9. (Original): The implant system of claim 1, wherein said truncated surface is concave.

10. (Original): The implant system of claim 1, further comprising an osteogenic material contained within each of said pocket of each of said load bearing members and arranged to contact the adjacent vertebrae when the vertebrae are supported by said opposite end pieces.

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11. (Original): The implant system of claim 10, wherein said osteogenic material includes an osteogenic substance disposed within a carrier.

12. (Original): The implant system of claim 11, wherein said carrier is a collagen sheet wound around said central elements within each of said pocket of said load bearing members.

13. (Original): The implant system of claim 11, wherein said osteogenic substance is a bone morphogenetic protein.

14. (Withdrawn): The implant system of claim 11, wherein said two opposite surfaces of at least one of said end pieces includes threads.

Claims 15-29 (Cancelled).

30. (Previously presented): A method of promoting fusion bone growth in the space between adjacent vertebrae, said method comprising:

(a) providing an implant system including first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members including:

opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae,

said central element being sized relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate

contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces,

at least said first load bearing member including at least one opposite end piece having a truncated surface configured to nest within said second load bearing member;

a bone growth inductive material disposed around said central body and in intimate contact with the adjacent vertebrae when said central body is within the space between adjacent vertebrae;

(b) preparing said adjacent vertebrae to receive said implant in an intervertebral space between adjacent vertebrae; and

(c) placing said implant system into the intervertebral space after said preparing step, wherein said placing includes engaging one of the opposite end pieces of said second load bearing member with said truncated surface of said second load bearing member to nest said first load bearing member with said second load bearing member.

Claim 31 (Cancelled).

32. (Previously presented): An implant system for promoting fusion bone growth in a space between adjacent vertebrae, comprising:

a first osteogenic fusion device including a first end piece, a second end piece, and a central element, said central element of said first fusion device extending between said first end piece of said first fusion device and said second end piece of said first fusion device, said central element of said first fusion device having an outer diameter; wherein said first and second end piece of said first fusion device each have an outer diameter that is greater than said outer diameter of said central element of said first fusion device to minimize stress shielding along said central element of said first fusion device;

a second osteogenic fusion device including a first end piece, a second end piece, and a central element, said central element of said second fusion device extending

between said first end piece of said second fusion device and said second end piece of said second fusion device; and

wherein said first end piece of said first fusion device has a cutout region defined by a truncated surface, said first end piece of said second fusion device being received in said cutout region of said first end piece of said first fusion device to nest said first fusion device with said second fusion device.

33. (Original): The system of claim 32, wherein said truncated surface has a concave shape.

34. (Withdrawn): The system of claim 33, wherein said first end piece of said second fusion device and said second end piece of said second fusion device each have a generally cylindrical shape.

35. (Withdrawn): The system of claim 32, wherein said second end piece of said first fusion device has a pair of opposite truncated surfaces disposed between a pair of bone contacting surfaces.

36. (Original): The system of claim 32, wherein said second end piece of said first fusion device has a cutout region defined by a truncated surface configured to nest with said second end piece of said second fusion device.

37. (Original): The system of claim 36, wherein:
said first end piece of said second fusion device has a cutout region defined by a truncated surface; and
said second end piece of said second fusion device has a cutout region defined by a truncated surface.

38. (Original): The system of claim 32, wherein:
said second end piece of said second fusion device has a cutout region defined by a truncated surface; and

said second end piece of said first fusion device is configured to nest within said cutout region in said second end piece of said second fusion device.

39. (Withdrawn): The system of claim 32, wherein:
said first fusion device and said second fusion device are configured to resist lateral expulsion;

said cutout region of said first end piece of said first fusion device defines an opening serving as a female member; and

said first end piece of said second fusion device having a mating member sized to fit within said opening of said first fusion device to serve as a male member.

40. (Withdrawn): The system of claim 39, wherein said first end piece of said first fusion device has a stop member positioned to be contacted with said mating member of said second fusion device.

41. (Withdrawn): The system of claim 39, further comprising a connecting plate spanning across said first end piece of said first fusion device and said first end piece of said second fusion device.

42. (Original): The system of claim 32, wherein when said first fusion device and said second fusion device are nested together a pocket is created to contain osteogenic material for promoting unshielded bone growth between the adjacent vertebrae.

43. (Previously presented): An implant system for promoting fusion bone growth in the space between adjacent vertebrae including at least first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members comprising:

opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae;

said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;

at least said first load bearing member including at least one opposite end piece having a truncated surface configured to nest within said second load bearing member;

an osteogenic material contained within each of said pocket of each of said load bearing members and arranged to contact the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;

wherein said osteogenic material includes an osteogenic substance disposed within a carrier; and

wherein said carrier is a collagen sheet wound around said central elements within each of said pocket of said load bearing members.

44. (Previously presented): An implant system for promoting fusion bone growth in a space between adjacent vertebrae, comprising:

first and second fusion devices, each of said devices including opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent

vertebrae, said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;

wherein at least one of the opposing end pieces of the first fusion device defines a cutout region that is concave in shape and at least one of the opposing end pieces of the second fusion device is received in the cutout region to nest the second fusion device with the first fusion device.

45. (Previously presented): The implant system of claim 44, wherein:
both the opposing end pieces of the first fusion device each have the cutout region that is concave in shape; and

both the opposing end pieces of the second fusion device are nested within respective ones of the opposing end pieces of the first fusion device.

46. (Previously presented): The implant system of claim 45, wherein at least one of the opposing end pieces of the second fusion device defines a cutout region that is concave in shape.

47. (Previously presented): The implant system of claim 46, wherein both the opposing end pieces of the second fusion device have the cutout region that is concave in shape.

48. (Withdrawn): The implant system of claim 44, wherein both the opposing end pieces of the second fusion device are generally cylindrical in shape.

49. (Withdrawn): The implant system of claim 44, wherein the end piece opposite the end piece with the cutout region in the first fusion device is generally cylindrical in shape.

50. (Withdrawn): The implant system of claim 44, wherein:
at least one of the opposite end pieces of the second fusion device has a male member;
the cutout region in at least one of the opposite end pieces of the first fusion device forms a female member; and
the male and female members interlock with one another to resist lateral separation of the first and second fusion devices.

51. (Withdrawn): The system of claim 50, wherein the first fusion device has a stop member positioned to be contacted with the male member of the second fusion device.

52. (Withdrawn): The system of claim 50, further comprising a connecting plate spanning across the first fusion device and the second fusion device.

53. (Withdrawn): The implant system of claim 44, wherein:
the end piece opposite the end piece with the cutout region in the first fusion device has non-circular surfaces that are substantially flat;
at least one end piece of the second fusion device has non-circular surfaces that are substantially flat; and
the first fusion device and the second fusion device contact one another at their respective non-circular surfaces.

54. (Withdrawn): The implant system of claim 44, wherein the opposite end pieces of the first fusion device are threaded.

55. (Previously presented): The implant system of claim 44, further comprising osteogenic material packed in a pocket defined between the first fusion device and the second fusion device.

56. (Previously presented): The implant system of claim 44, further comprising an insertion tool attached to the first fusion device.

57. (Previously presented): An implant system for promoting fusion bone growth between vertebrae, comprising:

a first load bearing member including a first end piece, a second end piece and a central element that connects the first end piece of the first load bearing member to the second end piece of the first load bearing member, the central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;

a second load bearing member including a first end piece, a second end piece and a central element that connects the first end piece of the second load bearing member to the second end piece of the second load bearing member; and

wherein the first end piece of the first load bearing member has a truncated surface that defines a cutout region, and the first end piece of the second load bearing member is nested within said cutout region.

58. (Previously presented): The implant system of claim 57, wherein the first and second end pieces of both the first and second load bearing members have an overall cylindrical shape to promote implantation.

59. (Previously presented): The implant system of claim 58, wherein the truncated surface of the first load bearing member has a concave shape to receive the first end piece of the second load bearing member.

60. (Previously presented): The implant system of claim 57, wherein the truncated surface of the first load bearing member has a concave shape to receive the first end piece of the second load bearing member.

61. (Previously presented): A method, comprising:
providing first and second fusion devices, each of said devices including opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae, said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;

forming a surgical window into a disc space between adjacent vertebrae;

implanting the first fusion device between the vertebrae by inserting the first fusion device through the surgical window, wherein at least one of the opposing end pieces of the first fusion device has a cutout region;

implanting the second fusion device between the vertebrae by inserting the second fusion device through the surgical window; and

nesting the second fusion device with the first fusion device within the surgical window by positioning at least a portion of one the end pieces of the second fusion device in the cutout region of the first fusion device.

62. (Previously presented): The method of claim 61, further comprising:
wherein both the opposing end pieces of the first fusion device have the cutout region; and

wherein said nesting includes engaging the opposing end pieces of the second fusion device with the cutout regions of the first fusion device.

63. (Previously presented): The method of claim 61, further comprising:
packing osteogenic material in a pocket formed between the first and second fusion devices.

64. (Withdrawn): The method of claim 61, further comprising:
wherein at least one of the opposing end pieces of the second fusion device has a cutout region; and

wherein said nesting includes positioning at least a portion of one the end pieces of the first fusion device in the cutout region of the second fusion device.

65. (Withdrawn): The method of claim 61, further comprising:
wherein at least one of the opposite end pieces of the second fusion device has a male member;

wherein the cutout region in at least one of the opposite end pieces of the first fusion device forms a female member; and

wherein said nesting includes interlocking the male member with the female member to resist lateral separation of the first and second fusion devices.

66. (Previously presented): An implant system for promoting fusion bone growth in the space between adjacent vertebrae, comprising:

- at least first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members including
 - opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae,
 - said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces,
 - at least said first load bearing member including at least one opposite end piece having a truncated surface; and
 - an osteogenic material contained within each of said pocket of each of said load bearing members and arranged to contact the adjacent vertebrae when the vertebrae are supported by said opposite end pieces;
 - wherein said osteogenic material includes an osteogenic substance disposed within a carrier;
 - wherein said carrier is a collagen sheet wound around said central elements within each of said pocket of said load bearing members; and
 - wherein at least one of said opposite end pieces of said second load bearing member contacts said truncated surface of said first load bearing member to nest the first and second load bearing members together.

67. (Previously presented): An implant system for promoting fusion bone growth in a space between adjacent vertebrae, comprising:

a first fusion device being dumbbell shaped, the first fusion device including a central element that connects opposing end pieces;

a second fusion device being a dumbbell shaped, the second fusion device including a central element that connects opposing end pieces; and

wherein at least one of the opposing end pieces of the first fusion device defines a cutout region that is concave in shape and at least one of the opposing end pieces of the second fusion device is received in the cutout region to nest the second fusion device with the first fusion device;

wherein both the opposing end pieces of the first fusion device each have the cutout region that is concave in shape;

wherein both the opposing end pieces of the second fusion device are nested within respective ones of the opposing end pieces of the first fusion device; and

wherein at least one of the opposing end pieces of the second fusion device defines a cutout region that is concave in shape.